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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/848,831	05/19/2004	James F. Bredt	ZCO-100	4783
51414 7590 04/16/2008 GOODWIN PROCTER LLP PATENT ADMINISTRATOR EXCHANGE PLACE BOSTON, MA 02109-2881				
EXAMINER AHMED, SHEEBA				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/848,831

Applicant(s)

BREDT ET AL.

Examiner

SHEEBA AHMED

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2008 and 06 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4, 5, 7, 9-11, 13-19, 22-24, 76, 78, 80, 82 and 83 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 5, 7, 9-11, 13-19, 22-24, 76, 78, 80, 82 and 83 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-848)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/4/08; 3/6/08
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Amendments to claims 1, 10, 11, 13, 76, 78, 80, and 83 have been entered in the above-identified application. Claims 3, 6, 8, 12, 20, 21, 25-75, 77, 79, 81, and 84-87 are cancelled. **Claims 1, 2, 4, 5, 7, 9-11, 13-19, 22-24, 76, 78, 80, 82, and 83 are now pending.**

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 82 is rejected under 35 U.S.C. 102(b) as being anticipated by Liu et al. (US 6,780,368).

Liu et al. disclose a freeform fabrication method for fabricating a 3-D multi-material or multi-color object from successive layers of a primary body-building powder, at least a modifier material and a binder powder in accordance with a computer-aided design of the object (Abstract). The method includes, in combination, the following steps: (a) providing a work surface; (b) feeding a first layer of a primary body-building powder material to the work surface (e.g., by using a traditional powder feeder

commonly used in selected area sintering and 3-D powder printing processes); (c) operating an electrophotographic powder deposition means to create transferable powder toner images of a binder powder and at least a modifier powder in accordance with the CAD design; (A plurality of modifier powders may form separate toner images or may be combined to form one composite toner image.) (d) transferring the transferable modifier and binder powder images, one image at a time, in a desired sequence onto the first layer of the primary body-building powder material; (e) applying energy means to fuse said binder powder, allowing the resulting fused binder fluid to permeate downward through the first layer of primary body-building material for bonding and consolidating the particles in the first layer to form a first cross-section of the object; (f) feeding a second layer of a primary body-building powder material onto the deposited first layer and repeating the operating, transferring, and applying steps to form a second cross-section of the object. The binder powder could include a resin composition that can be cured or hardened with heat, ultra violet light, electron beam, ion beam, plasma, microwave, X-ray, Gamma ray, or a combination thereof. Alternatively, the binder powder could include a lower-melting material that can be readily fused to become a fluid. Once permeating through a layer of primary body-building powder material for providing bridges between particles, the binder fluid can be cooled down to below the melting point of the binder material and be solidified. If the binder contains a photo-curable adhesive composition, the pre-heat energy intensity and the energy of the imposing light source (heat and light constituting the energy means) should be provided in such a fashion that successive layers can be affixed

together to form a unitary body of the 3-D object. If the binder contains a heat-fusible material composition, a complete body-building powder layer can be pre-heated by other heat sources (e.g., infrared, IR) disposed near the object-building zone to a temperature sufficient for melting the binder composition. After a selected duration of time, this heat source may be switched off to allow the binder fluid (already permeating through a layer) to solidify. If the layer of primary body-building material is already mixed with component compositions of a binder (excluding a photo-initiator, for instance), the electro-photographic powder deposition means may be used to transfer an image of the photo-initiator powder to the positive region of the layer. In the presently invented method, the photo-curable binder may consist of such adhesive compositions as a base resin, a hardening or cross-linking agent, a photo-initiator, a photo-sensitizer, and possibly with additional catalyst and/or reaction accelerator. All of these compositions, if in a powder form, may be mixed together to form a complete binder adhesive mixture. The powder inside a powder feeder may comprise a primary body-building material (fine particles), additives (physical or chemical property modifiers), and secondary ingredients (selected compositions of a binder adhesive). In this method, the primary body-building powder may be composed of one or more than one type of fine particles. The particle sizes are preferably smaller than 100 microns. The primary body-building powder may be selected from the following three basic types of powders and include fine particles of a primary body-building material selected from polymers, ceramics, glass, metals and alloys, carbon, and combinations thereof. The polymers may be thermoplastic (e.g., **polyvinyl chloride**) or thermosetting (e.g.,

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polyimide oligomer or prepolymer powder). Both the primary body-building powder material and the modifier powder may be selected from a broad array of materials including various organic (including polymers) and inorganic substances (including ceramic, metal, glass, and carbon based materials) and their mixtures (See entire document). All limitations of claim 82 are disclosed in the above reference.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 76, 78, 80, and 83 are rejected under 35 U.S.C. 102(b) as being anticipated by Lauchenauer (US 4,649,077).

Lauchenauer disclose a heat activatable adhesive formed from at least two components each in the form of discrete, flowable particles which are capable of adhering in abutment of one particle with another to provide an open structured, porous matrix. The adhesive may be in the form of a sheet formed by blending the particles of each component, applying the mechanical mixture to a supporting sheet, heating the mixture and supporting sheet to the temperature at which the material with the lowest tackifying temperature becomes tacky, applying pressure sufficient to partially flatten the largest particles to a degree such that their minimum dimension is substantially equivalent to the thickness of the layer formed on said support sheet and during or

after said pressure application. Components useful as components in the sheet are for instance: thermoplastic polymers: polymeric hydrocarbons (e.g. polyethylene, polypropylene), acrylates, polyesters, polyamides (in particular terpolymers), vinyl compounds (e.g. polyvinylacetates), copolymerisates of olefinic, acrylic and vinylic monomers, block polymers, mixtures of polymers, polyurethanes (including elastomeric polyurethanes), polylactones, polylactames. Any polymer capable of being tackified if heated to a temperature in the range of 50 to 200°C. may be used. The mixture of polymers may contain agents lowering the tackifying temperature or increasing tackiness. One method consists in incorporating an auxiliary agent capable of strongly swelling or even dissolving at least one of the interacting components, this auxiliary agent being released or activated only when proper heat and/or pressure are applied to the conglomeratic material. The Examples show that a two-component conglomeratic sheet material, capable of being thermally activated, was produced by scattering a mixture of 60% by weight of a high density polyethylene and 40% of a polyamide terpolymer onto a release paper and a mixture of 50 parts of polyethylene and 100 parts of cellulose acetate partly hydrolyzed was applied by scattering particles onto a release paper.

4. Claims 1, 2, 4, 5, 7, 9-11, 13-19, and 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Counsell et al. (US 4,061,825 A).

Counsell et al. discloses water-activatable tapes comprising a substrate of fibrous or foamed plastics material impregnated or coated with a water-reactive cementitious

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composition which is reactive with water to form a set mass, the composition containing at least one cement, especially Portland cement, a non-water sensitive polymeric binder, such as a natural or synthetic rubber, and a water-sensitive additive which is compatible with the polymeric binder and is sufficiently water-sensitive to at least swell in contact with water (See Abstract). In the dry state of the tape the binder functions to bind the dry particles of cement to the substrate of the tape and prevent the cement from being washed off the substrate when the tape is activated with water. Such binders are organic polymeric materials and are preferably natural or synthetic rubbers, e.g. nitrile rubber, polyurethanes, polychloroprene, styrene butadiene rubbers, epichlorhydrin rubber, natural and reclaimed rubber and synthetic polyisoprene, chlorinated polyisoprene, polyisobutylene, polybutadiene, butyl and chlorosulfonated polyethylene elastomers and graft polymers thereof. Other, non-rubbery polymers, useful as binders for the purposes of the present invention, include polyolefins, polyvinyl ethers, polyvinyl acetate, polyvinyl alcohol, polyvinyl butyrates, polyamides, polyacrylates, polymethacrylates, polystyrene, ABS, chlorinated PVC, polyvinylidene chloride, chlorinated natural rubber, polysulphide, silicones, polyesters, unsaturated polyesters, epoxide resins, bitumens and asphalts and drying oil based materials such as alkyd resins. Such polymers or copolymers may be used separately or in admixture with two or more polymers or additional modifying agents. Typical cements or cement mixes useful include Portland cement, white cement, Ciment Fondu, stearate coated cement or mixtures of such materials with inert diluents such as silica, clays, calcium carbonate, gypsum, talc, fluorspar, barytes, pulverised fly ash and metal oxides. The

inert diluents may also act as pigments. (See Column 1, lines 63-68; Column 2, lines 1-21, Column 4, lines 27-36). All limitations of claims 1, 2, 4, 5, 7, 9-11, 13-19, and 22-24 are disclosed in the above reference.

Response to Arguments

5. Applicant's arguments filed on January 4, 2008 have been fully considered but they are not persuasive.

Applicants traverse the rejection of claim 82 under 35 U.S.C. 102(b) as being anticipated by Liu et al. (US 6,780,368) and submit that Liu does not appear to teach applying at least one of an ultraviolet light, a visible light, or an electron beam on the printed layer to induce a non-aqueous fluid to solidify, as required by claim 82 and rather, Liu appears to disclose applying an energy source to either cure or harden a resin composition or to fuse a lower-melting material to become a liquid that is subsequently cooled to become a solid. However, the Examiner disagrees. Liu specifically discloses a freeform fabrication method for fabricating a 3-D multi-material or multi-color object from successive layers of a primary body-building powder, at least a modifier material and a binder powder wherein energy means (heat, ultra violet light, electron beam, ion beam, plasma, microwave, X-ray, Gamma ray, or a combination thereof) are applied to fuse the binder powder, allowing the resulting fused binder fluid to permeate downward through the first layer of primary body-building material for bonding and consolidating the particles in the first layer to form a first cross-section of the object or wherein the binder powder includes a lower-melting material that can be

readily fused to become a fluid. Once permeating through a layer of primary body-building powder material for providing bridges between particles, the binder fluid can be cooled down to below the melting point of the binder material and be solidified. If the binder contains a photo-curable adhesive composition, the pre-heat energy intensity and the energy of the imposing light source (heat and light constituting the energy means) should be provided in such a fashion that successive layers can be affixed together to form a unitary body of the 3-D object. Hence, Liu teaches applying at least one of an ultraviolet light, a visible light, or an electron beam on the printed layer to induce a non-aqueous fluid to solidify and thus meets the limitations of claim 82.

Applicants traverse the rejection of claims 1, 2-5, 7, 9-11, 13-19, 22-24, 76, 78, 80, and 83 under 35 U.S.C. 102(b) as being anticipated by Lauchenauer (US 4,649,077) and submit that it is clear that Lauchenauer does not teach or suggest the application of a fluid to a film of a loose and free-flowing particulate mixture, as recited in independent method claims 76, 78, and 80 and teaches from the use of liquid-bonding systems. Lauchenauer appears to mention liquids only with respect to the prior art, with liquid adhesives being used to join two layers of a composite sheet material in column 1, lines 13-16. Again, the Examiner disagrees. Lauchenauer disclose a heat activatable adhesive formed from at least two components each in the form of discrete, flowable particles which are capable of adhering in abutment of one particle with another wherein mixture incorporates an auxiliary agent capable of strongly swelling or ***even dissolving at least one of the interacting components*** (See Column 5, lines 11-25) and hence meet the limitation of applying a fluid that at least partially dissolves

the adhesive particles. Furthermore, the Examiner would like to point out that the claims recite the application of a fluid and not a liquid. A fluid can be a liquid or a gas.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **SHEEBA AHMED** whose telephone number is (571)272-1504. The examiner can normally be reached on **Monday-Friday** from 8am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571)272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sheeba Ahmed/
Primary Examiner, Art Unit 1794